

Pontics and the Edentulous Ridge

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Resources: Shillingburg et al
Rosenstiel et al
Eissmann, H.F.

Pontic Design and the Edentulous Ridge



Esthetic

Appearance of replacement
"Grows" from edentulous ridge
Space for porcelain

Biologic

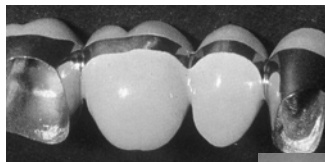
Cleansable tissue surface
Access to abutments
No pressure on ridge

Mechanical

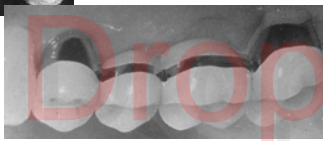
Rigid: resist deformation /
porcelain fracture
Strong connectors



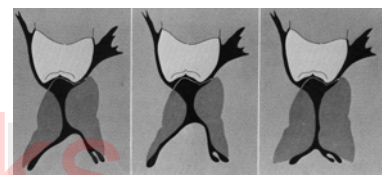
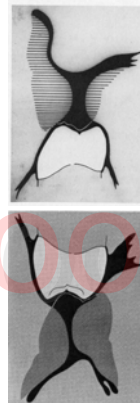
Pontic Materials and Design



- Glazed porcelain
- Highly polished gold
- M-C finish line: not on edentulous ridge
- Acrylic resin (porous) – poor surface
- Proper design most important



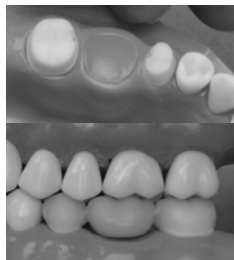
Alveolar Ridge Resorption



Normal Minimal Excessive

Edentulous space defined by its boundaries:
Edentulous ridge, opposing occlusion,
tongue and cheek.

Alveolar Ridge Resorption (Minimal)



- Broad ridge / vertical height
 - Uncommon
 - Can compromise occlusocervical dimension →
 - decreased strength of restoration
 - limits restoration possibilities

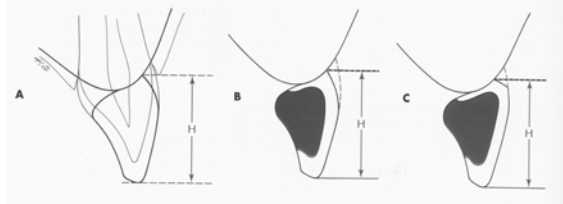
Changes in the edentulous ridge



- Alveolar resorption and remodeling
 - Apical and facial resorption
 - Greater with trauma / periodontal disease
- Pontic or tissue modifications for esthetics



Pontic Contour Changes with Ridge Resorption



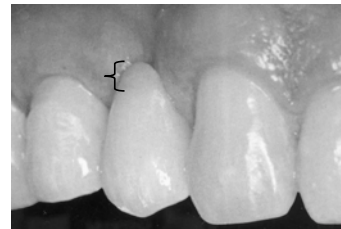
- A pontic should have the same incisogingival height as original (or contralateral) tooth.
- With resorption, the pontic becomes longer in order to contact the ridge concavity.
- Contour must be blended smoothly to avoid a ledge at the cervical.

Esthetic Modification: Gingival Contour of Pontic



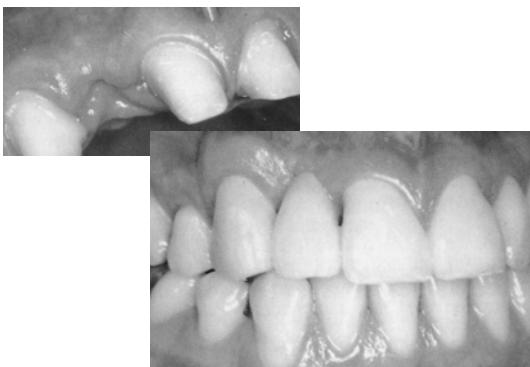
- Contour in apical ½ should approximate length of adjacent teeth.

Esthetic Modification: Gingival Contour of Pontic

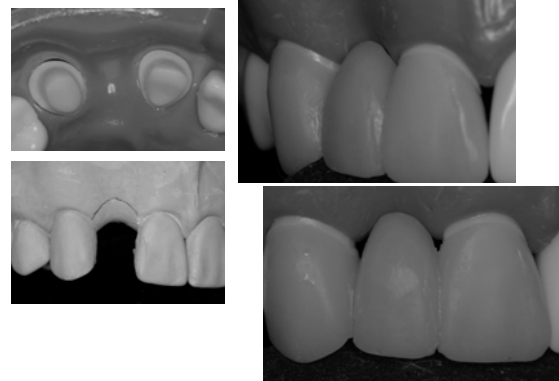


- Contour in apical ½ should approximate length of adjacent teeth.
- The facial surface must be altered to curve gently from the G-F angle to the middle of facial surface

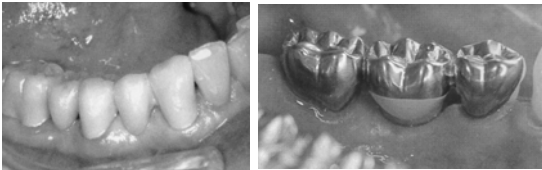
Esthetic Modification of Pontic Contour



Esthetic Modification of Pontic Contour



Biological Considerations: Ridge Contact



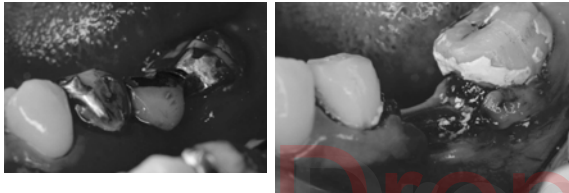
- Any contact should be pressure-free
- Keratinized attached tissue
- No contact with ridge if possible or smallest possible area with convex pontic surface

Tissue Contact of Pontic

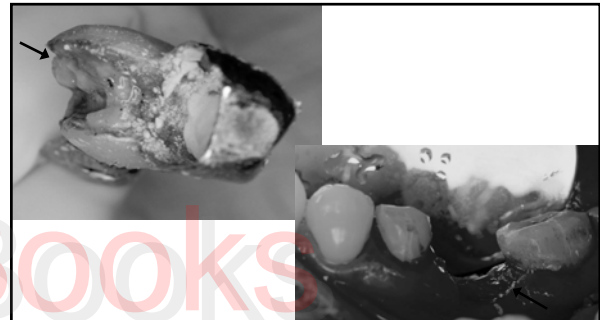


Contact on non-keratinized mucosa / low frenum attachment must be adjusted to avoid ulceration.

Ridge-Lap and Tissue Impingement



- Pressure by pontic → tissue necrosis
- Keratinized tissue contact only
- Avoid non-keratinized tissue and frenum attachments.
- Floss should pass through without resistance.



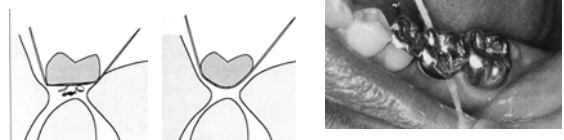
- Severe ridge lap of pontic prevents cleaning.
- Pontic pressure causes tissue ischemia and necrosis.

Tissue Contact of Esthetic Pontics

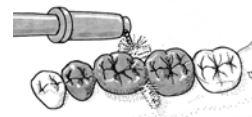


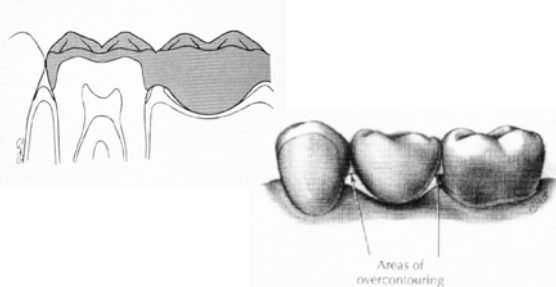
- Area of contact small and convex.
- No space between pontic and soft tissue of facial side of ridge
- Contact on attached keratinized gingiva only
- No pressure on the ridge

Oral Hygiene



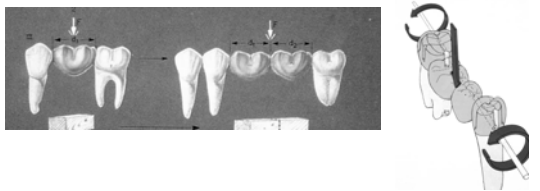
- Convex smooth surface of pontic
- Adequate gingival embrasures
- Patient education and hygiene aids
 - Floss threader; Super-floss / gauze; Proxy-brush





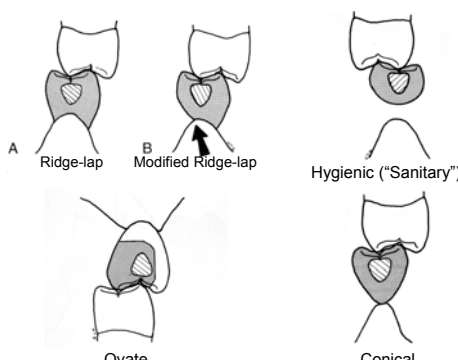
- Connectors and pontic contours must not impinge on gingival tissue → gingival inflammation / recession / necrosis.
- Yet there must be adequate thickness for strength
- Strength properties of materials

Mechanical Considerations



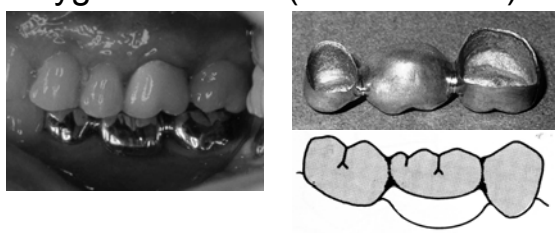
- Strength: thickness of pontic / connector
- Material: metal > metal-ceramic > ceramic
- Position: straight line as possible
- Occlusion: normal centric contacts
 - Occlusal table commensurate with occlusion
 - Narrowing pontic ≠ decreased occlusal force

Pontic Designs



A Ridge-lap
B Modified Ridge-lap
Hygienic ("Sanitary")
Ovate
Conical

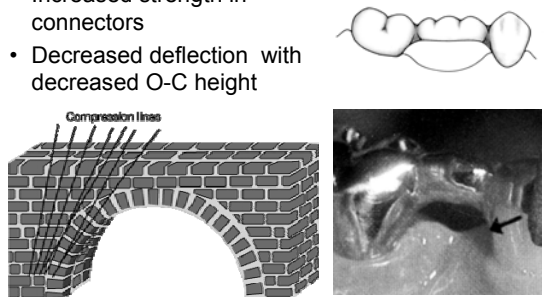
Hygienic Pontic (Non-Esthetic)



- No contact with the residual ridge
- ~2mm space between apical portion of pontic and ridge (tissue proliferation if too close)
- At least 3mm thick for strength
- Convex contour FL / MD ("fishbelly")

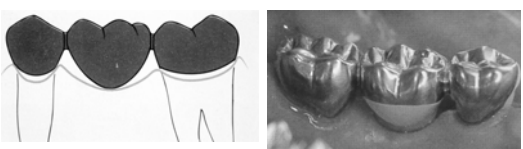
Modified Hygienic Pontic ("Perel")

- Increased strength in connectors
- Decreased deflection with decreased O-C height




Compression lines

Conical Pontic



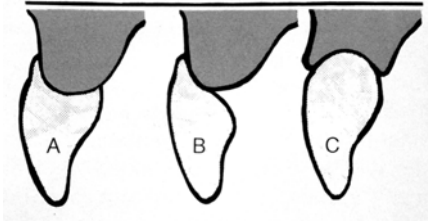
- Small convex area of contact at center of ridge.
 - Easy to clean / comfortable for patient
- Facial / lingual contours depend on residual ridge width



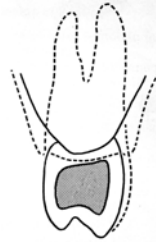
Point contact w/ broad ridge → food entrapment

Esthetic Pontic Designs

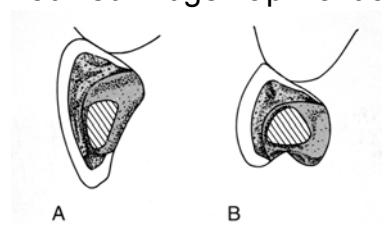
- Ridge Lap
- Modified Ridge Lap
- Ovate



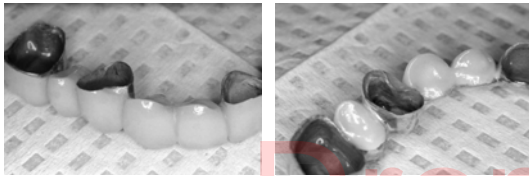
Modified Ridge Lap Pontic



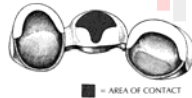
Ridge-lap Pontic:
Not cleansable



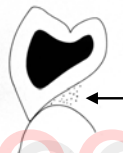
Modified Ridge Lap Pontic



- Ridge contact on the facial half of ridge
- Contour of tissue-contacting area is convex
- Slight faciolingual concavity on facial side of ridge
- Tissue contact resembles a "T"



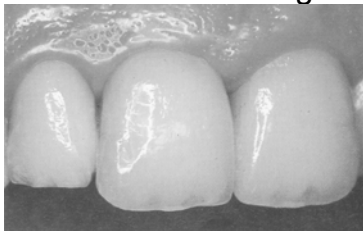
Intimate tissue contact on facial helps prevent debris accumulation



Modified ridge-lap pontic



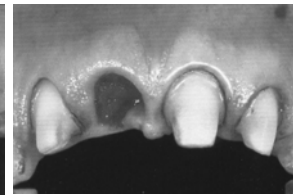
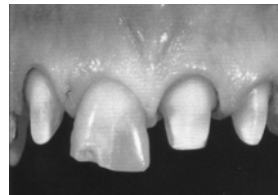
Ovate Pontic Design



- Blunt / rounded apex set into ridge concavity
- Broad flat (rounded) ridge
- Concavity formed by:
 - Immediate provisional restoration
 - Surgical creation

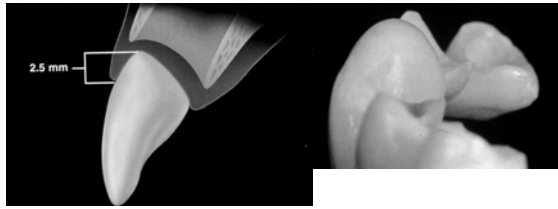


Ovate Pontic: Immediate Provisional FPD



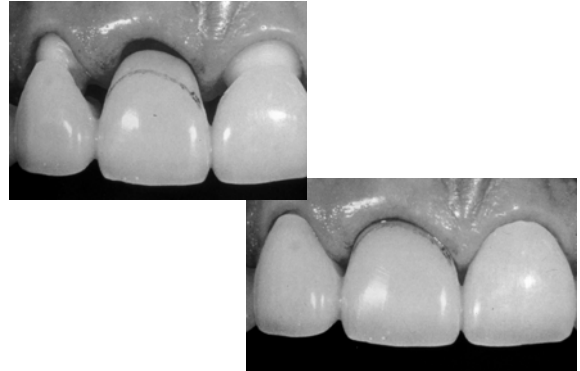
- Adjacent teeth prepared as abutments for FPD
- TE with fiberotomy / rotational motion to protect the facial bone.

Ovate Pontic: Immediate Provisional FPD

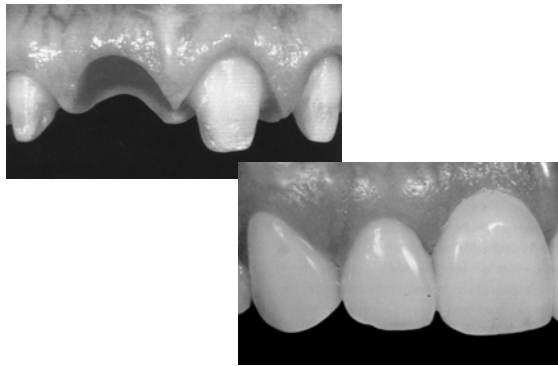


- Facial contour extends 2.5 mm apical to FGM; reduced to 1mm – 1.5mm at 4 weeks

Ovate Pontic: Immediate Provisional FPD

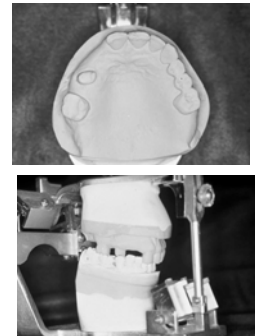


Ovate Pontic: Immediate Provisional FPD



Pre-Treatment Assessment

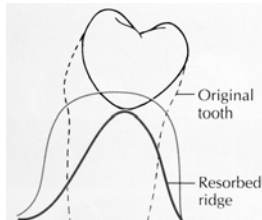
- Pontic Space
 - M-D space (tipping)
 - I-G space (supraeruption)
 - Orthodontics
 - Diagnostic Waxing
- Residual Ridge Contour
 - Pontic modifications
 - Surgical modifications
 - Gingival architecture preservation



Residual Ridge Deformities

Siebert, JS (*Compend Contin Educ Dent* 4:437, 1983)

- Class I: Faciolingual (32%)
- Class II: Ridge height (3%)
- Class III: Height and width (56%)
- (No defect ~ 4%)



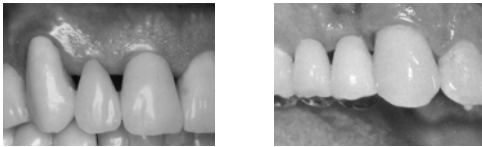
Lateral resorption → narrow ridge
Vertical resorption → ridge height defect

Pontic Modifications:



- Vertical resorption requires excessive pontic length
- Contour retainers / pontics normally; shape and stain pontic extension to simulate root surface.

Pontic Modifications:
"Black Triangles" – open embrasures / resorption



- Unesthetic loss of interdental papillae with ridge resorption
- Plaque accumulation
- Interference with flossing
- May reduce rigidity of pontic span

Narrow faciolingual ridge width
"knife-edge ridge"

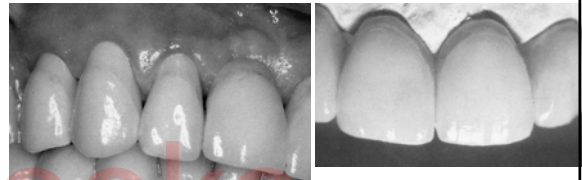


- Esthetic problems
- Cleansability usually not a problem

Pontic Modifications

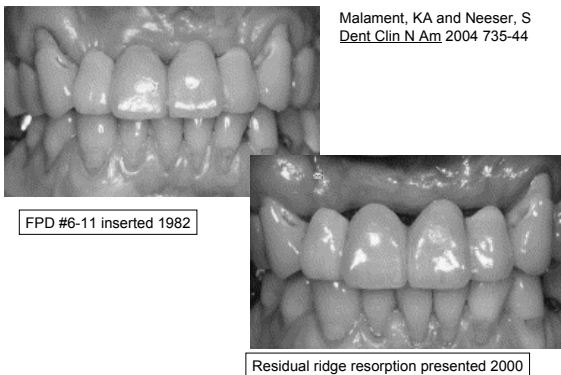


Esthetic Modification of Pontic Contour

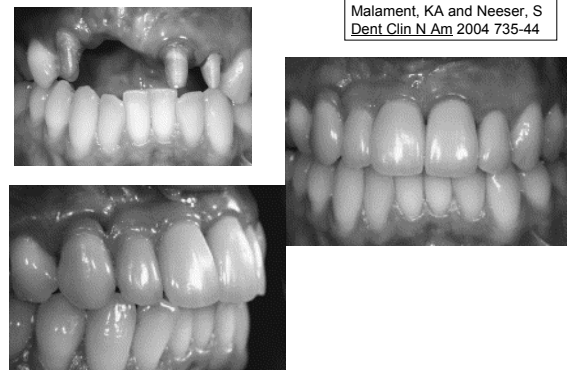


- Apparent shortening of crown with cervical shading
- Pink porcelain to simulate gingivae
- Decreased embrasure space with cervical contouring

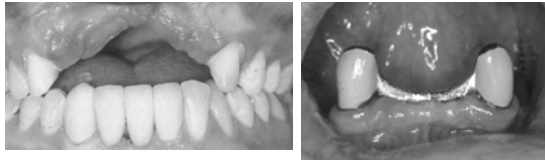
Management of deficient ridge with shaded gingival porcelain



Management of deficient ridge with shaded gingival porcelain



Gross Tissue Defects Trauma / Ablation Surgery

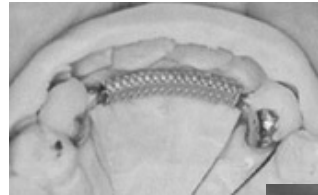


Bone grafting / soft tissue surgery
may not be feasible

Andrews Bridge:
Metal bar / abutments
Removable section w/ internal clip



"Andrews Bridge"

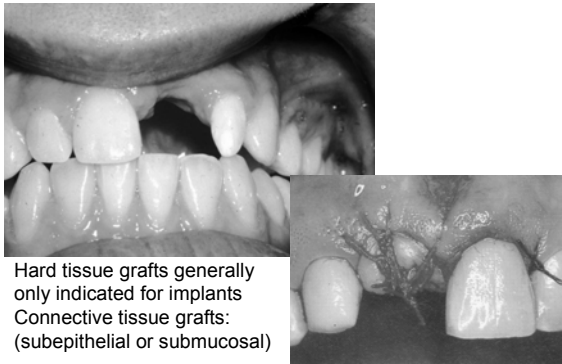


Fixed retainers are
connected by a
rectangular bar which
follows the curve of the
ridge.

Denture teeth are set in an
acrylic resin flange that
clips over and is stabilized
by the bar.



Soft Tissue Augmentation Surgery

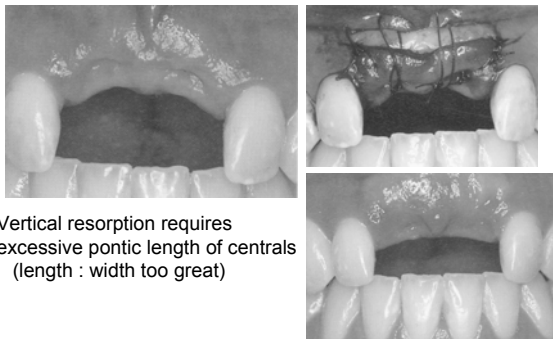


Hard tissue grafts generally
only indicated for implants
Connective tissue grafts:
(subepithelial or submucosal)

Ovate Pontic: Surgical Augmentation



Soft-Tissue Augmentation Surgery



Vertical resorption requires
excessive pontic length of centrals
(length : width too great)

Post-surgical Ridge Augmentation



Balance
- Tooth length:width
- Central:Lateral proportion

